Amendments to the Claims

Please amend the claims without prejudice. The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

[c1]   (Original) A method for determining a downhole parameter in a drilling environment, comprising:

activating, by an activation device (6), drilling fluid flowing past the activation device;

turning off the activation device (6) for a time sufficient to create an unactivated slug of drilling fluid;

detecting the unactivated drilling fluid slug at a known distance (d) from the activation device (6); and

determining a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d).

[c2]   (Original) The method of claim 1, further comprising calculating drilling fluid velocity from the time-of-flight (t) and the known distance (d).

[c3]   (Original) The method of claim 2, wherein calculating the fluid velocity includes using a rate-of-penetration correction.

[c4]   (Original) The method of claim 1, further comprising calculating borehole volume over the distance (d) using a known surface volumetric flow rate.

[c5]   (Original) The method of claim 4, further comprising calculating a borehole diameter from the borehole volume.

[c6]   (Original) The method of claim 1, further comprising calculating a downhole volumetric flow rate from the time-of-flight (t) and a known borehole volume.

[c7]   (Currently amended) The method of ~~any of~~ claims 1-~~6~~, wherein the method is performed using a logging-while-drilling tool.

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[c8]   (Currently amended) The method of ~~any of~~ claims 1-~~7~~, wherein the fluid flowing past the activation device is flowing toward a surface location.

[c9]   (Currently amended) The method of ~~any of~~ claims 1-~~8~~, wherein the unactivated drilling fluid slug is detected using a gamma ray detector located in a drill string tool the distance d from the activation device.

[c10]   (Original) The method of claim 1 wherein the distance d is chosen such that the unactivated drilling fluid slug is detected within about 30 seconds from when it passes the activation device.

[c11]   (Original) A tool for determining a downhole parameter in a drilling environment, wherein the tool is adapted to be placed in a drill string and wherein the tool comprises a activation device (6) and a gamma ray detector (7) separated along a drill string axis thereof by a distance d, the tool further comprising:

control circuitry to turn off the activation device (6) for a time sufficient to create an unactivated slug of drilling fluid flowing past the tool; and

processing means (17), coupled to the gamma ray detector (7), for determining when the unactivated slug of drilling fluid flows past the gamma ray detector (7).

[c12]   (Original) The tool of claim 11, wherein the processing means further determines a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d).

[c13]   (Original) The tool of claim 12, wherein the processing means is configured to calculate drilling fluid velocity from the time-of-flight (t) and the known distance (d).

[c14]   (Original) The tool of claim 11, wherein the processing means is configured to calculate borehole volume over the distance (d) using a known volumetric flow rate.

[c15]   (Original) The tool of claim 14, wherein the processing means is configured to calculate a borehole diameter from the borehole volume.

[c16]   (Original) The tool of claim 12, wherein the processing means is configured to calculate a downhole volumetric flow rate from the time-of-flight (t) and a known borehole volume.

[c17] (Currently amended) The tool of ~~any of~~ claims 11–~~16~~, wherein the tool comprises a logging-while-drilling tool.

[c18] (Currently amended) The tool of ~~any of~~ claims 11–~~17~~, wherein the fluid flowing past the activation device is flowing outside the tool.